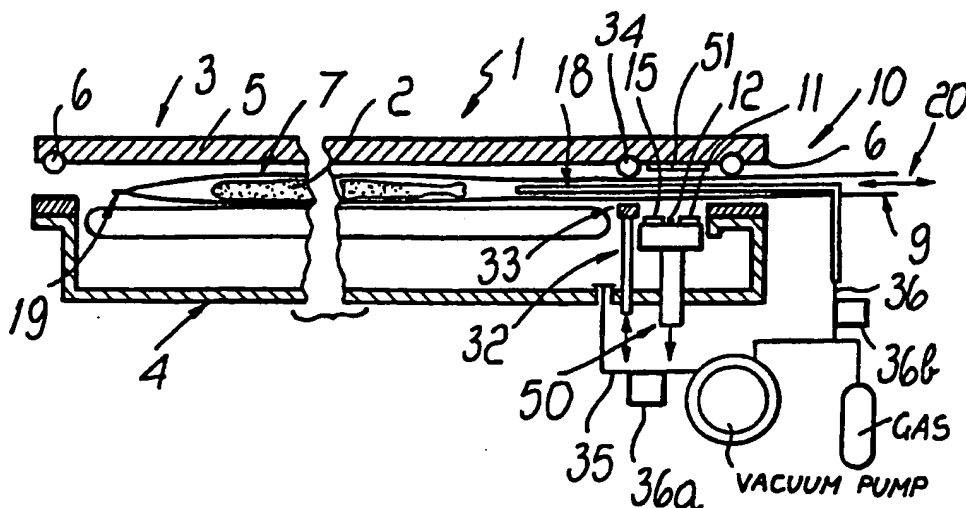




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: DEVICE FOR PACKAGING MATERIALS IN A VACUUM CHAMBER



## (57) Abstract

A packaging device, particularly for foodstuffs or technical materials, comprising a bell-shaped vacuum chamber (3). A single-folded film (7) can be placed in the vacuum chamber and the foodstuff can be inserted from the open longitudinal side (9) of the film. Inside the bell-shaped vacuum chamber (3) there is also provided a first transverse thermal bonding bar (11), which is laterally adjacent to a cutting blade (12), and a second thermal bonding bar (15), both bars being L-shaped. At least one nozzle (18) for introducing gas is furthermore provided so as to face the longitudinal or transverse open side (9) of the single-folded film (7).

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## DEVICE FOR PACKAGING MATERIALS IN A VACUUM CHAMBER

### Technical Field

The present invention relates to a packaging device, particularly for foodstuffs or technical materials.

### Background Art

Vacuum-forming machines with a bell-shaped chamber are currently known which comprise a vacuum pump connected to a  
5 chamber, also known as vacuum chamber, and inside which a preformed pouch, open on three sides, is usually placed; a foodstuff is placed inside the pouch.

Therefore, in these conventional machines the preformed pouch already contains the foodstuff when it is  
10 inserted in the vacuum chamber, then vacuum is formed inside the chamber and thermal bonding is carried out at the free side of the preformed pouch.

This conventional technology entails the need to use preformed pouches, whose size is therefore comparable to  
15 the size of the product; considerable manual labor is also required.

Accordingly, there are operating steps which extend the time required to achieve vacuum packaging of the product; moreover, if packaging occurs in a controlled  
20 atmosphere, most of the gas is wasted, since it is diffused not only in the pouch but mostly inside the vacuum chamber.

EP-603.704 is also known in which foodstuffs are packaged by using a plastic film which is guided through a folding station in order to obtain a double layer and is  
25 then thermally bonded so as to form pockets.

The pockets are provided with the intended size or

capacity before being filled and sealed.

Thermal bonding and formation are followed by filling, closure and cutting of the resulting pockets or pouches: this solution, however, is complicated, in that it entails  
5 a plurality of separate stations for performing the individual operations to which the plastic film must be subjected sequentially.

Hot or cold formation of the plastic film is furthermore provided for, in addition to filling, by means  
10 of a nozzle, with liquid products, flours or finely granulated products, and therefore it is not possible to use the solution described for solid products having preset volumes, such as sliced ham and the like, meat, cheeses divided into portions, trays containing foodstuffs and non-  
15 food products.

Moreover, in the conventional described solution, in order to close the pocket or pouch it is necessary to make it pass through various operating steps, with the consequent need for optimum centering of the pouch at each  
20 station so as to allow the optimum intended treatment.

#### Disclosure of the Invention

The aim of the present invention is to solve the above-described problems, by eliminating the drawbacks of the cited prior art and thus by providing a device which allows the vacuum or compensated-vacuum packaging of  
25 technical products or foodstuffs such as sliced ham or the like, meat, cheeses divided into portions, and trays containing food and non-food products.

Within the scope of this aim, an important object of the present invention is to provide a device which allows

to package said products quickly and with limited personnel intervention.

Another important object of the present invention is to provide a product packaging device which has a reduced  
5 operating cycle with short execution times.

Another important object of the present invention is to provide a device in which said packaging can occur at a very low cost for each individual package.

Another important object of the present invention is  
10 to provide a device which also allows to use shrink-wrap films, optionally with the possibility to use a reduced amount of gas which is sufficient only for the package that contains the product.

Another object of the present invention is to provide  
15 a device which is also reliable and safe in use.

This aim, these objects and others which will become apparent hereinafter are achieved by a packaging device, particularly for foodstuffs or technical materials, which comprises a bell-shaped vacuum chamber, characterized in  
20 that at least one single-folded film can be placed in said bell-shaped vacuum chamber, said product or material being insertable from an open longitudinal side of said film, said bell-shaped vacuum chamber containing a first transverse thermal bonding bar, which is laterally adjacent  
25 to a cutting blade, and a second thermal bonding bar, said first and second bars being L-shaped, at least one nozzle for vacuum and/or for introducing gas or mixtures being provided so as to face one of said longitudinal open sides.

#### Brief Description of the Drawings

Further characteristics and advantages of the present

invention will become apparent from the following detailed description of two particular embodiments thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

5        figure 1 is a partially sectional side view of the components of the device;

         figure 2 is a top view of the device;

         figure 3 is a view of the arrangement of the nozzle;

         figure 4 is a different view of the nozzle;

10       figure 5 is a partially sectional side view of the components of a second embodiment;

         figure 6 is a perspective view of the components of the device of figure 5;

         figure 7 is a schematic plan view of the components of  
15 the device of figure 5;

         figure 8 is a sectional view, taken along a plane which lies transversely to the advancement of the film at the bell-shaped vacuum chamber of the device of figure 5.

#### Ways of carrying out the Invention

         With reference to the above figures, the reference  
20 numeral 1 designates the packaging device particularly for technical materials or foodstuffs, which are designated by the reference numeral 2.

         The device 1 comprises a bell-shaped vacuum chamber, designated by the reference numeral 3, which is  
25 substantially constituted by a lower container 4 and by a closeable upper cover 5; suitable first strips or gaskets 6 for airtightness are provided perimetrically with respect to the container 4 and the cover 5.

         The device uses a single-folded film 7, which as such

has a first longitudinal side 8 which is closed and a second longitudinal side 9 which is open.

A first thermal bonding bar 11 is arranged transversely inside the bell-shaped vacuum chamber 3 at its inlet 10; a substantially L-shaped cutting blade 12 is arranged laterally to said first thermal bonding bar 11, and a first wing 13 of the blade is parallel to the first thermal bonding bar 11, whilst the second wing 14 is arranged at right angles to the first wing in the direction of the advancement of the single-folded film 7.

A likewise L-shaped second thermal bonding bar 15 is provided adjacent to the cutting blade 12 and forms a third wing 16, which is adjacent and parallel to the first wing 13, and a fourth wing 17, which is adjacent and parallel to the second wing 14.

The first thermal bonding bar 11, the second thermal bonding bar 15 and the cutting blade 12 are advantageously but not necessarily associated with a same support 50 which is movable inside the bell-shaped vacuum chamber and work in abutment against suitable contrast elements 51 which are associated inside the cover 5.

The bell-shaped vacuum chamber 3 also contains at least one nozzle 18 which allows to produce vacuum and/or to inject gas or mixtures either at the second open longitudinal side 9 of the single-folded film or at the fourth transverse side 20 which is adjacent to the lateral inlet 10 of the bell-shaped vacuum chamber.

The solution shown in figure 2 uses a nozzle 18 which has a lens-shaped cross-section and is inserted hermetically from the lateral inlet 10 of the bell-shaped

chamber by means of a suitable piston 31.

Once vacuum or vacuum plus gas has been formed, the piston 31 causes the nozzle to retract in order to allow activation of the first and second thermal bonding bars 11,15 and of the cutting blade 12 so as to obtain a closed package 21.

In this case, there is provided a presser 32 which can move inside the bell-shaped chamber 3 and provides a seal because of the presence, at one of its ends, of a second strip or gasket 33 which works in contrast with a third strip or gasket 34 arranged inside the cover 5.

Preferably, the vacuum and/or the controlled atmosphere are produced in the bell-shaped chamber and inside the package 21 across a first path 35 and a second separate path 36, each whereof has a sensor 36a and 36b which detects and controls internal pressure.

In the solution shown in figure 5 there is provided only the support 50 for the first and second thermal bonding bars and the cutting blade, whilst the nozzle 18 is arranged at the second longitudinal side 9.

Use of the device is therefore as follows: assuming that the system is already in a steady-state operating condition, the third transverse side 19 of the single-folded film 7, which is adjacent to the lateral exit 30 in the bell-shaped vacuum chamber, is already partially sealed along its vertical extension; the operator then places the product 2 to be packaged inside the single-folded film through the second longitudinal side 9, which is open.

It is then sufficient to place inside the bell-shaped vacuum chamber the product contained in the single-folded



film; thereafter, by lowering the upper closeable cover 5, the vacuum or vacuum-gas cycle begins.

Differently from the solution of figure 1, in the solution of figure 5 there is a cost improvement thanks to the fact that the nozzle 18 is laterally adjacent to the second open longitudinal side 9 of the single-folded film: if gas is introduced, use of the gas is limited only to the volume of the single-folded film which, being placed inside the bell-shaped vacuum chamber, assumes a pocket-like configuration, since the fourth transverse side 20 is clamped between the strips 6.

At the end of the vacuum or vacuum-gas cycle, the nozzle, which advantageously has a lens-shaped cross-section, injects gas or mixtures, if required; then the first thermal bonding bar 11 is activated, forming the third closed transverse side 19 of the next container or package 21 that can be obtained; then the second thermal bonding bar 15 is activated, closing both the fourth transverse side 20 and the second longitudinal side 9.

During this cycle, the product is not moved inside the bell-shaped chamber.

A closed package 21 is then obtained by activating the cutting blade 12.

It is thus possible to open the bell-shaped chamber, remove the resulting package and start a new cycle.

It has thus been shown that the invention has achieved the intended aim and objects, a device having been provided which, by using a single-folded film, allows to obtain a vacuum or controlled-atmosphere package even with shrink-wrap films by means of an operating sequence that occurs

only at the bell-shaped vacuum chamber, without the need to handle the product, allowing to package solid products such as sliced ham or the like, meat, cheeses divided into portions and trays containing both foodstuffs and non-food  
5 products.

In the illustrated solutions, furthermore, formation and closure of the single-folded film occur at the bell-shaped vacuum chamber, simultaneously closing a transverse side of the next pouch, and all this occurs inside the  
10 bell-shaped vacuum chamber and during the same cycle.

It is also possible to use only the amount of gas required for the volume of the package that contains the product; all this allows to reduce the treatment times and costs of each individual package.

15 The invention is of course susceptible of numerous modifications and variations, all of which are within the scope of the same inventive concept.

The materials and the dimensions that constitute the individual components may also of course be the most  
20 pertinent according to specific requirements.

CLAIMS

1           1. A packaging device, particularly for foodstuffs or  
2 technical materials, comprising a bell-shaped vacuum  
3 chamber, characterized in that at least one single-folded  
4 film can be placed in said bell-shaped vacuum chamber, said  
5 product or material being insertable from an open  
6 longitudinal side of said film, said bell-shaped vacuum  
7 chamber containing a first transverse thermal bonding bar,  
8 which is laterally adjacent to a cutting blade, and a  
9 second thermal bonding bar, said bars being L-shaped, at  
10 least one nozzle for vacuum and/or for introducing gas or  
11 mixtures being provided so as to face one of said  
12 longitudinal open sides.

1           2. A device according to claim 1, comprising a bell-  
2 shaped vacuum chamber constituted by a lower container and  
3 an upper closeable cover, both of which are perimetrically  
4 provided with first sealing strips or gaskets,  
5 characterized in that at least one single-folded film can  
6 be placed inside said vacuum chamber and has a first  
7 longitudinal side which is closed and a second longitudinal  
8 side which is open.

1           3. A device according to claim 1, characterized in  
2 that it comprises means for closing the three open sides of  
3 said at least one single-folded film so as to form at least  
4 one closed pouch or container.

1           4. A device according to claims 1 and 3, characterized  
2 in that said means are constituted by at least a first  
3 thermal bonding bar, a second thermal bonding bar and a  
4 cutting blade.

1           5. A device according to claims 1 and 4, characterized  
2 in that at the inlet side of said at least one single-  
3 folded film there is provided, inside said bell-shaped  
4 vacuum chamber, said first thermal bonding bar, which is  
5 arranged along an axis that runs transversely to the  
6 insertion axis of said single-folded film.

1           6. A device according to claims 1 and 5, characterized  
2 in that said substantially L-shaped cutting blade is  
3 adjacent to said first thermal bonding bar.

1           7. A device according to claims 1 and 6, characterized  
2 in that said cutting blade has a first wing which is  
3 adjacent to said first thermal bonding bar and a second  
4 wing which is arranged at right angles thereto.

1           8. A device according to claims 1 and 7, characterized  
2 in that said second L-shaped thermal bonding bar is  
3 adjacent to said cutting blade.

1           9. A device according to claims 1 and 8, characterized  
2 in that said second thermal bonding bar has a third wing,  
3 which is adjacent to said first wing of said cutting blade,  
4 and a fourth wing, which is adjacent to said second wing of  
5 said cutting blade.

1           10. A device according to one or more of the preceding  
2 claims, characterized in that the steps for producing  
3 vacuum and/or introducing gas or mixtures, for the thermal  
4 bonding and cutting of said at least one single-folded film  
5 occur whilst keeping said product in the same position.

1           11. A device according to one or more of the preceding  
2 claims, characterized in that said first thermal bonding  
3 bar forms, at the end of each cycle, a third transverse  
4 side which is closed or partially closed for said at least

5 one single-folded film.

1 12. A device according to one or more of the preceding  
2 claims, characterized in that said second welding bar  
3 produces, at said third and fourth wings, the complete  
4 closure of the sides of said at least one single-folded  
5 film so as to obtain a closed package.

1 13. A device according to one or more of the preceding  
2 claims, characterized in that said product can be inserted  
3 at said second open longitudinal side of said at least one  
4 single-folded film and in that the product and the film in  
5 combination can then be inserted in said bell-shaped vacuum  
6 chamber, which can then be closed again.

1 14. A device according to claims 1 and 13,  
2 characterized in that it produces vacuum at least inside  
3 said at least one single-folded film contained in said  
4 bell-shaped vacuum chamber and then optionally injects gas  
5 or mixtures.

1 15. A device according to claims 1 and 14,  
2 characterized in that said first thermal bonding bar, said  
3 cutting blade and said second thermal bonding bar are  
4 activated subsequently so as to obtain said package.

1 16. A device according to one or more of the preceding  
2 claims, characterized in that it comprises a first path and  
3 optionally a second path for forming vacuum and/or  
4 injecting gas or mixtures, each path having a sensor for  
5 detecting and controlling the pressure inside said bell-  
6 shaped chamber and/or said single-folded film.

1 17. A device according to one or more of the preceding  
2 claims, characterized in that said first and second thermal  
3 bonding bars and said cutting blade are associated with at

4     least one support which can move inside said chamber and  
5     interact with suitable contrast elements associated inside  
6     said cover.

1           18. A device according to one or more of the preceding  
2     claims, characterized in that said nozzle is hermetically  
3     inserted in, and extracted from, said bell-shaped chamber  
4     by means of a suitable piston.

1           19. A device according to claims 1 and 18,  
2     characterized in that said seal is ensured by a presser  
3     which can move inside said bell-shaped chamber and has, at  
4     one of its ends, a second strip or gasket which acts in  
5     contrast with a third strip or gasket arranged inside said  
6     cover.

1           20. A device according to claims 1, 14 and 18,  
2     characterized in that said nozzle is arranged at said  
3     second open longitudinal side of said single-folded film.

1           21. A device according to claims 1, 14 and 18,  
2     characterized in that said nozzle is arranged at said  
3     fourth transverse side of said single-folded film, which is  
4     adjacent to the lateral inlet of said bell-shaped chamber.



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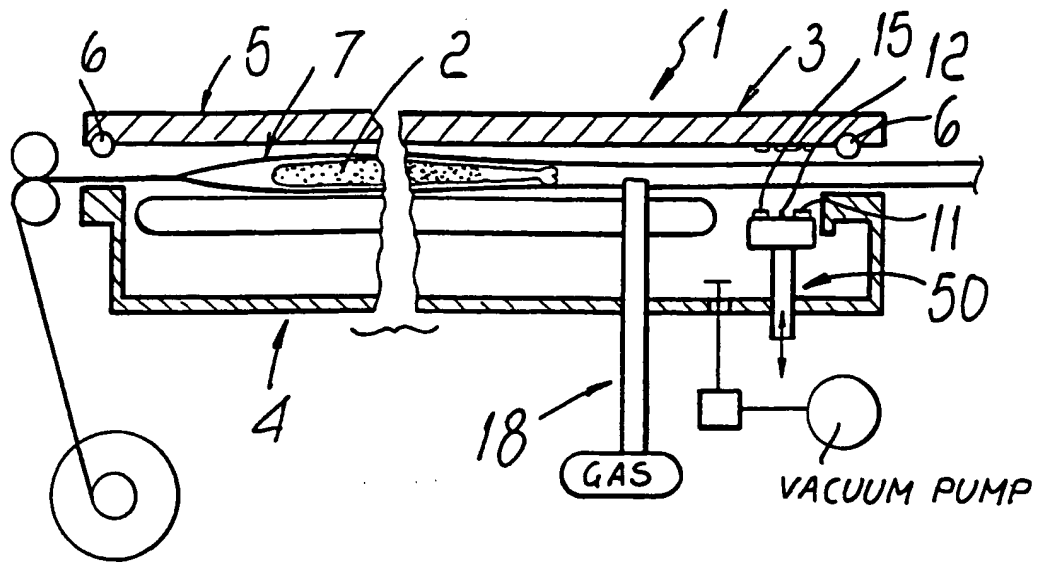


Fig. 5

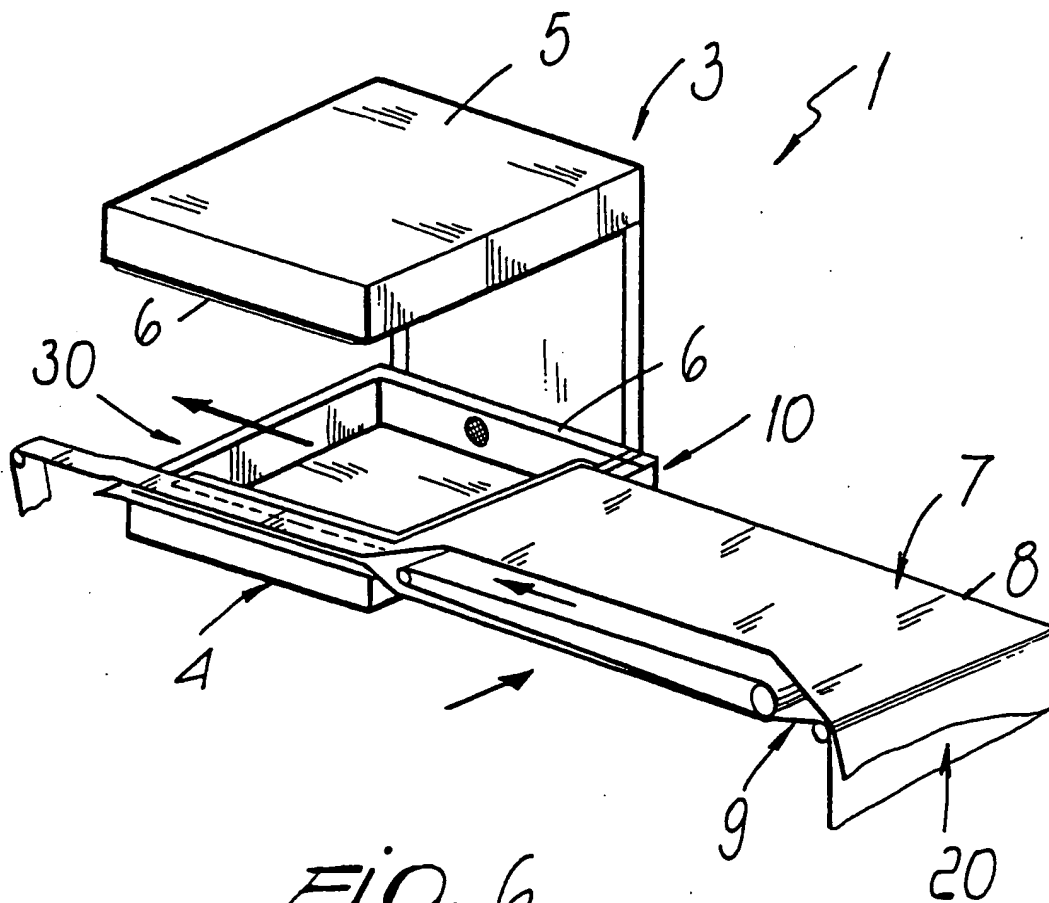
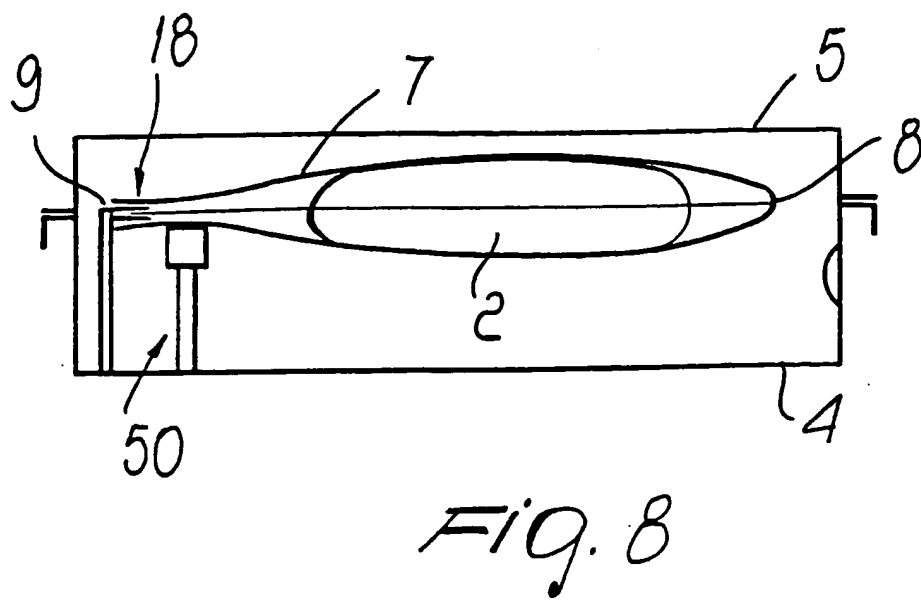
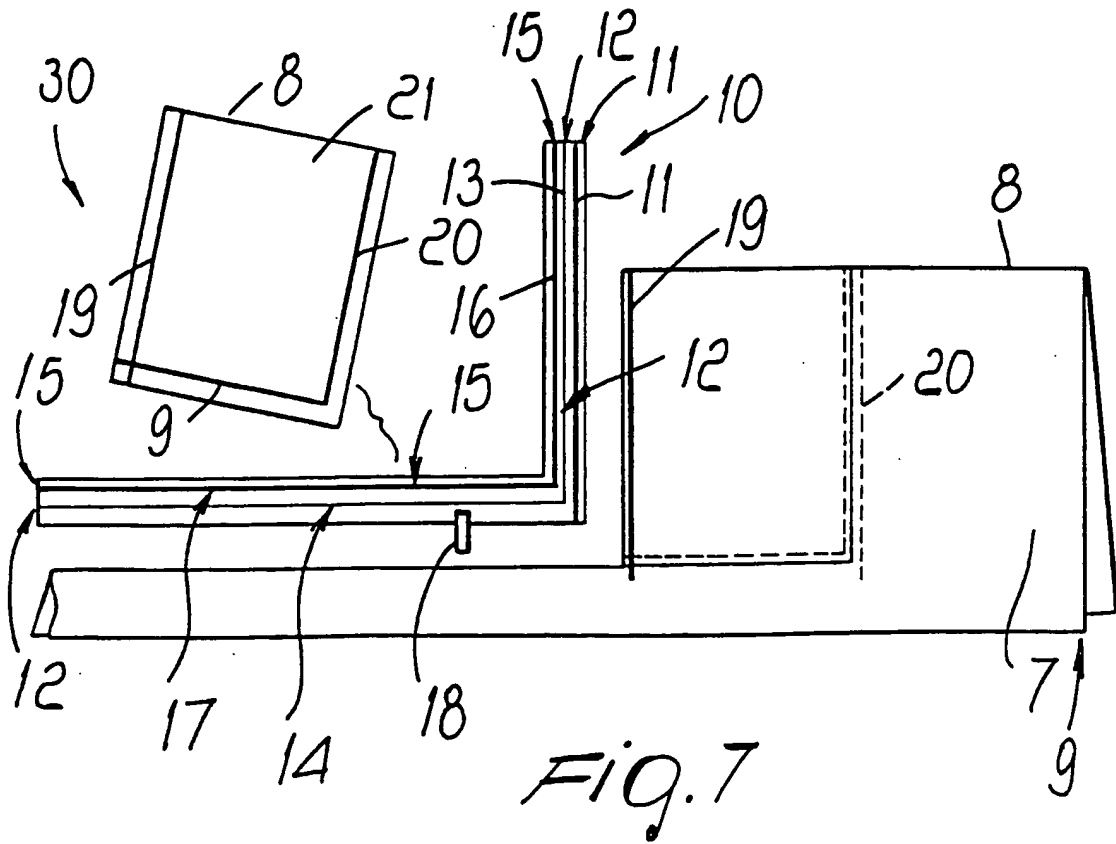


Fig. 6





# INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 98/01756

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 B65B31/02 B65B11/48 B65B31/04

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	EP 0 832 819 A (SCOLARO) 1 April 1998 see the whole document ---	1-21
A	US 4 177 622 A (WELDOTRON) 11 December 1979 see the whole document ---	1
A	GB 974 529 A (SMITH & NEPHEW) 4 November 1964 ---	1
A	US 2 780 043 A (HENGSEN) 5 February 1957 see the whole document -----	1

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